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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,973	05/30/2001	Kenichi Tomioka	500.40168X00	5284

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EXAMINER

SELLERS, ROBERT E

ART UNIT	PAPER NUMBER
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1712

14

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

LN 14

Office Action Summary

Application No.

09/856,973

Applicant(s)

TOMIOKA ET AL.

Examiner

Robert Sellers

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1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 10-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 10-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

The amendment filed January 27, 2003 (Paper No. 10) is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The amendments to Table 2 on page 32 of the specification cannot be validated by the mere opinion of the inventor in the declaration filed January 27, 2003 in the absence of a reliance upon certified translations of Table 1 on page 14 of Japanese priority application no. 10-365947 and/or Table 1 on page 13 of Japanese priority application no. 10-365948, or the filing of substantiating laboratory pages under 37 CFR 1.132.

It cannot be ascertained whether Table 2 on page 32 reflects the examples in Table 1 of the priority applications because Table 2 contains Examples 5-8 (four examples) and Comparative Examples 6-10 (five examples) whereas Table 1 of the priority applications report Examples 1-3 (three examples) and Comparative Examples 1-4 (four examples).

The amendment filed September 20, 2002 (Paper No. 6) is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The replacement of the "2-undecylimidazole ("C11Z" on page 25, Example 4, line 20 with 1-cyano-2-methylimidazolium trimellitate("2MZ-CNS"). Although Example 4 of Table 1 on page 29 shows the use of 2MZ-CNS, there is no documentation indicating whether the C11Z in the description of Example 4 on page 25 or the tabulated 2MZ-CNS in Table 1 is the actual curing accelerator utilized.

Applicant is required to cancel the new matter in the reply to this Office Action.

Hefner, Jr. is rescinded due to the lack of recitation of the newly claimed polycyanate compound as a prepolymer.

The text of section 103(a) of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dershem in view of (Namba et al. and Japanese Patent No. 61-291615) and Sachdev et al.

Dershem discloses a composition comprising a cyanate ester such as L-10 (cols. 11-12, Table 1, Examples 3-12, 16-21, 24 and 25), F-10 or XU 71787 (col. 4, line 55), and a polyepoxide (col. 5, lines 1-4) in a molar ratio of between about 1:2 and about 5:1 (col. 4, lines 64-67) along with as much as about 0.1% relative to the cyanate ester of a metal catalyst (col. 7, lines 23-25, converted from 1000 parts/1,000,000), between about 1.0 and about 10.0 weight percent of an imidazole (col. 7, lines 51-53), and from about 0.5-1.0 weight percent of an antioxidant

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(col. 9, lines 23-26).

The claimed dicyclopentadiene-phenol epoxy resin of formula (1) is not recited. Namba et al. and the Japanese patent have been previously applied and described on page 2, the last paragraph of the Office action mailed June 24, 2002 (Paper No. 5). It would have been obvious to employ the dicyclopentadiene-phenol epoxy resin of Namba et al. and the Japanese patent as the polyepoxide of Dershem in order to lower the residual stress after resin curing and improve the heat resistance and flexibility (Namba et al., col. 1, lines 21-47) and enhance the moisture resistance and internal plasticity (Japanese '615).

Dershem does not mention whether the suitable cyanate esters such as L-10, F-10 and XU 71787 are prepolymers. Sachdev et al. sets forth a composition comprising an aryl dicyanate prepolymer such as Arocy L10 in admixture with an epoxy resin, benzyl dimethyl amine and copper acetylacetonate (col. 6, Example 4). The use of the aryl dicyanate wherein from 5-20% of the cyanate ester is converted to a prepolymer is preferred (col. 3, lines 41-44) and is exemplified by species including the Arocy L10, XU 71787 and Arocy F10 of Dershem (col. 3, lines 49-52, 57 and 63).

The exemplified L-10 and disclosed F-10 and XU 71787 of Dershem are inherently prepolymeric according to Sachdev et al.

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Claims 1-3 and 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al., Gaku et al. Patent No. 4,904,760, Gardner et al., Shimp and Japanese Patent No. 63-66219 in view of (Namba et al. and Japanese Patent Nos. 61-291615 and 2-214714) and Dershem.

Sachdev et al. is described hereinabove.

Gaku et al. espouses a prepreg or formulation for electrical parts (col. 10, lines 18 and 21) prepared from a polycyanate ester prepolymer (col. 3, lines 28-30), an epoxy resin (col. 3, lines 38-40), less than 10 weight percent (col. 9, lines 16-18) of a catalyst such as an imidazole (col. 8, lines 52-60) or an organometallic salt (col. 9, lines 2-6) and a variety of additives (col. 9, lines 19-21).

Gardner et al. is directed to an impregnating or encapsulating resin (col. 10, lines 66-68) obtained from 80 parts by weight of Cyanate Ester A prepolymer, 20 parts by weight of an epoxidized novolac resin (col. 4, lines 52-53 and 62-64; and col. 5, Table I, lines 44-48), a urea compound catalyst and modifying components such as stabilizers (col. 4, line 38).

Shimp is drawn to a printed wiring board or encapsulant (col. 2, lines 21-22 and col. 4, lines 35-36) formulated from a blend of tricyanate and dicyanate esters as prepolymers which facilitates its use as a prepreg (col. 3, lines 20-25), up to 70 weight percent of a polyepoxide (col. 4, lines 18-26), from about 0.001 to about 20 parts by weight of the cyanate ester blend of an organometallic curing catalyst (col. 3, lines 49-64), and additional components.

Japanese '219 describes a prepreg or semiconductor sealant comprising a polycyanate prepolymer and a polyepoxide.

The claimed dicyclopentadiene-phenol epoxy resin of formula (1) is not recited.

It would have been obvious to employ the dicyclopentadiene-phenol epoxy resin of Namba et al. and the Japanese patents as the polyepoxide of Sachdev et al., Gaku et al., Gardner et al., Shimp and Japanese '219 in order to lower the residual stress after resin curing and improve the heat resistance and flexibility (Namba et al., col. 1, lines 21-47), enhance the moisture resistance and internal plasticity (Japanese '615), and provide excellent through-hole reliability and high-frequency property (Japanese '741).

The claimed curing accelerator of a catalyst for curing the cyanate prepolymer (C)(i) and a curing accelerator for the epoxy resin (ii) is not recited. It would have been obvious to utilize a combination of a metal catalyst and imidazole curing catalyst of Dershem as the curing catalysts for Sachdev et al., Gaku et al., Gardner et al., Shimp and Japanese '219 in order to optimize the cure of both the cyanate ester and epoxy resin.

The claimed antioxidant is not recited. It would have been obvious to incorporate the antioxidant of Dershem as an additive to Sachdev et al., Gaku et al., Gardner et al., Shimp and Japanese '219 in order to improve the thermal stability (Dershem, col. 9, lines 23-26).

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rs 4/14/03

ROBERT E.L. SELLERS
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